

Group: Controls

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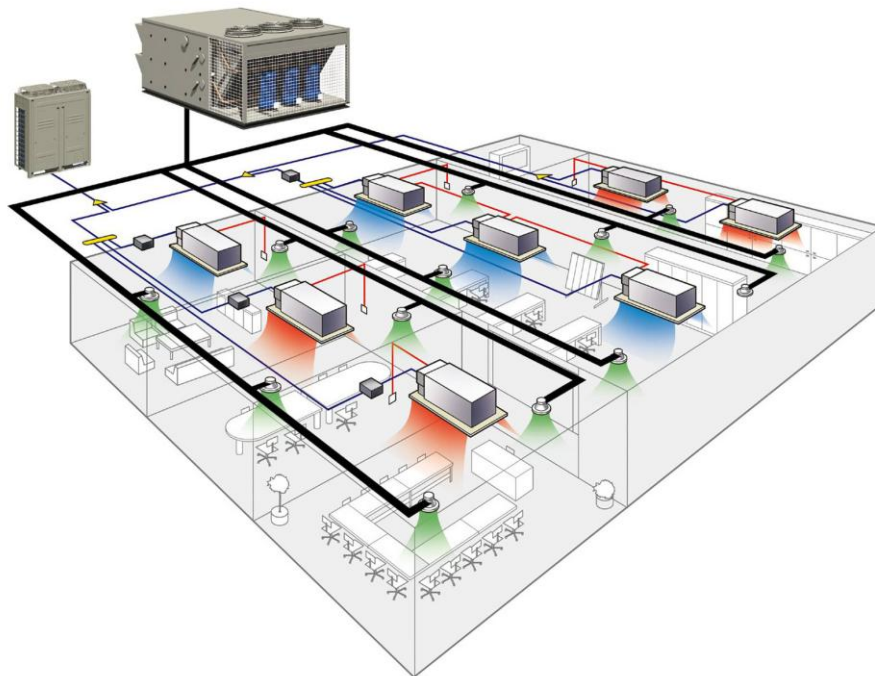
DIII-NET Communication Gateway

For McQuay Air Handling Units integrated with a Daikin VRV System

Commercial Rooftop Model: MPS

Applied Rooftops Models: RPS, RDT, RAH

Self-Contained Models: SWP and SWT



Contents

- FIGURES 3
- REVISION HISTORY 4
- REFERENCE DOCUMENTS..... 4
- LIMITED WARRANTY 4
- GENERAL INFORMATION 5**
 - HAZARD IDENTIFICATION MESSAGES..... 5
 - RECOGNIZE SAFETY SYMBOLS, WORDS AND LABELS..... 5
 - DESCRIPTION..... 6
 - APPLICATION..... 6
 - COMPONENT DATA 7
 - Light Emitting Diodes (LEDs)* 7
- INSTALLATION 8**
 - WIRING..... 8
 - New DIII-NET Communication Gateway*..... 8
 - Replacing an Existing DIII-NET Communication Gateway*..... 11
- INTEGRATION 12**
 - CONFIGURING THE DIII-NET COMMUNICATION GATEWAY 12
 - DIII-NET COMMUNICATION GATEWAY ADDRESSING..... 13
 - INTELLIGENT TOUCH CONTROLLER CONFIGURATION 15
 - Change Icon Intelligent Touch Controller:* 15
 - Creating a New Zone and Setting the Intelligent Touch Controller Dead Band* 17
 - INTELLIGENT TOUCH CONTROLLER OPERATION 19
 - MicroTech III Unit operation* 19
 - Adjusting Discharge Air Setpoint*..... 21
 - Adjusting Fan Speed*..... 22
- SERVICE INFORMATION 24**
 - TEST PROCEDURES 24
 - PARTS LIST..... 24
 - Communication Board* 24
- APPENDIX A..... 25**
 - ALARMS 25
- APPENDIX B 26**
 - CONFIGURABLE PARAMETERS 26

Figures

Figure 1, Maverick II Rooftop Unit	6
Figure 2, DIII-NET Communication Gateway	7
Figure 3, DIII-NET Communication Gateway in unit	8
Figure 4, DIII-NET Communication Gateway Schematics	9
Figure 5, DIII-NET Wiring Schematic.....	10
Figure 6, DIP Switches, 0110 1010.....	10
Figure 7 MicroTech III Menu Structure	13
Figure 8, Zone Screen on Intelligent Touch Controller.....	15
Figure 9, System Setting Screen Shot, Intelligent Touch Controller.....	15
Figure 10, Zone/Group Selection Screen, Intelligent Touch Controller.....	15
Figure 11, Zone / Group Screen	16
Figure 12, Group Settings Screen Shot	16
Figure 13, All Zones Display on Intelligent Touch Controller.....	17
Figure 14, System Settings Screen	17
Figure 15, System Menu for Selecting Zone/Group	17
Figure 16, System Zone Group Screen.....	18
Figure 17, System Menu for Setting up New Zone	18
Figure 18, Configure Screen for Setting Setpoint Range.....	19
Figure 19, Setpoint Range Configuration Screen	19
Figure 20, MicroTech III Air Handling Unit in Occupied Mode	20
Figure 21, MicroTech III Air Handler Unit in Unoccupied Mode	20
Figure 22, MicroTech III Air Handler in Unoccupied Operation.....	20
Figure 23, With MicroTech III Air Handling Unit Selected	21
Figure 24, Configure Screen for MicroTech III Air Handling Unit	21
Figure 25, With USw.Spt version, repeat steps 1 and 2 above.....	22
Figure 26, MicroTech III Air Handling Unit Selected.	22
Figure 27, Advanced Settings Configuration Screen.....	23

Revision History

IM 1133

August 2011

Initial release

Reference Documents

Number	Company	Title	Source
OM 920	McQuay International	MicroTech III Applied Air Handling Unit Controller Operation and Maintenance Manual	www.mcquay.com
IM 919	McQuay International	MicroTech III Applied Air Handling Unit Controller Installation Manual	www.mcquay.com
DCS601C71	Daikin Air Conditioning Americas	Intelligent Touch Controller Installation Manual	www.daikinac.com
ED72-423	Daikin Air Conditioning Americas	Design Guide Intelligent Touch Controller	www.daikinac.com

Limited Warranty

Consult your local McQuay Representative for warranty details. Refer to Form 933-43285Y. To find your local McQuay representative, go to www.mcquay.com.

Notice

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General Information

This manual contains the information you need to install the DIII-NET Communication Gateway on a MicroTech® III Applied Air Handling Unit (AAH) Controller (i.e., RoofPak™ applied rooftop, Maverick™ II commercial rooftop or Self-Contained Unit), incorporate it into the DIII-Net network, and maintain it.

Hazard Identification Messages

Recognize Safety Symbols, Words and Labels

The following symbols and labels are used throughout this manual to indicate immediate or potential hazards. It is the owner and installer's responsibility to read and comply with all safety information and instructions accompanying these symbols. Failure to heed safety information increases the risk of property damage and/or product damage, serious personal injury or death. Improper installation, operation and maintenance can void the warranty.

DANGER

Dangers indicate a hazardous situation which will result in death or serious injury if not avoided.

WARNING

Warnings indicate potentially hazardous situations, which can result in property damage, severe personal injury, or death if not avoided.

CAUTION

Cautions indicate potentially hazardous situations, which can result in personal injury or equipment damage if not avoided.

WARNING

Electric shock hazard. Can cause personal injury or equipment damage.

This equipment must be properly grounded. Connections and service to the MicroTech III Air Handling Unit Controller must be performed only by personnel knowledgeable in the operation of the equipment being controlled.

CAUTION

Static sensitive components. Can cause equipment damage.

Discharge any static electrical charge by touching the bare metal inside the control panel before performing any service work. Never unplug cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

NOTICE

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense. **McQuay International disclaims any liability resulting from any interference or for the correction thereof.**

⚠ WARNING

Electric shock hazard. Can cause personal injury or equipment damage.

This equipment has exposed electrical connections inside DIII-Net Communication Gateway. Only personnel that are knowledgeable in the operation of this equipment must perform connections and service to the DIII-NET-Net Communication Gateway.

Description

The DIII-NET Communication Gateway allows communication between the MicroTech III unit controller and the Daikin variable air volume (VRV) DIII network via a Modbus[®] communication Gateway (DIII-NET Communication Gateway).

Figure 1, Maverick II Rooftop Unit



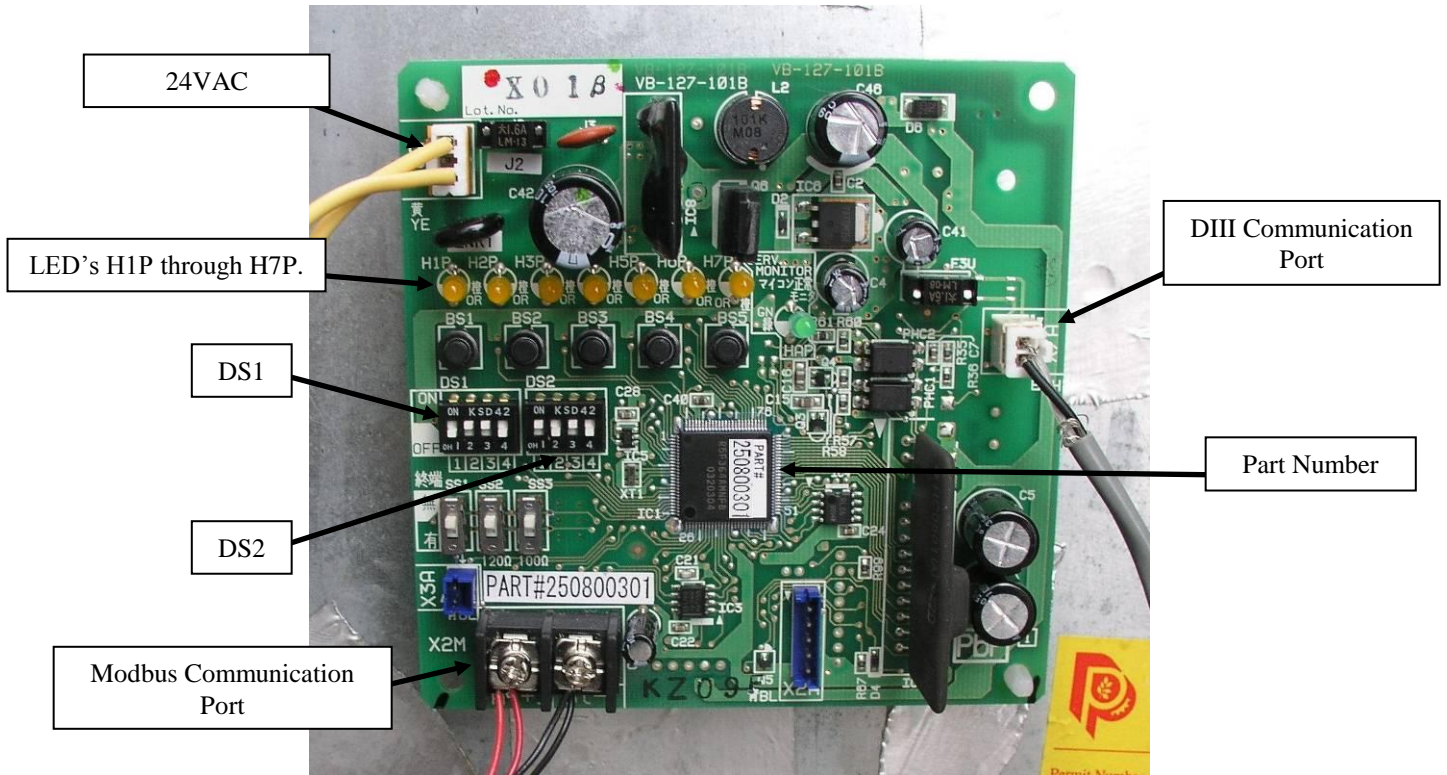
Application

The MicroTech III controller will act as a Modbus master device communicating with the DIII-NET Communication Gateway acting as a Modbus slave device. The DIII-NET Communication Gateway will translate the Modbus point information into the DIII-NET protocol and vice-versa.

Component Data

Major components of the DIII-NET Communication Gateway are labeled in Figure 2.

Figure 2, DIII-NET Communication Gateway



Light Emitting Diodes (LEDs)

The LED's on the DIII-NET Communication Gateway are used to indicate either the DIII-NET Communication Gateway is working correctly or there is a fault. A description of what each of the LEDs being energized or de-energized means is listed in Table 1.

Table 1, LED's

LED	Function	OFF	ON
H1P	DIII-NET Sending	Not Transmitting	Transmitting
H2P	DIII-NET Receiving	Not Receiving	Receiving
H3P	Modbus Sending	Not Transmitting	Transmitting
H4P	Modbus Receiving	Not Receiving	Receiving
H5P	MicroTech III Fault Indication	No Faults	Fault Alarm
H6P	MicroTech III Problem Indication	No Problems	Problem Alarm
H7P	MicroTech III Warning Indication	No Warnings	Warning Alarm
HAP	Micro Computer Normal	800ms Flashing Period Indicates Operation	

Installation

The DIII-NET Communication Gateway will be factory installed. If it is necessary to field install this board, see section [Replacing DIII-NET Communication Gateway](#). Because the board has already been factory installed, the only thing needed is to connect the correct wiring and configure the MicroTech III controller.

Wiring

⚠ CAUTION

Electrostatic discharge hazard.

Can cause equipment damage.

This equipment contains sensitive electronic components that may be damaged by electrostatic discharge from your hands. Before you handle a communications module, you need to touch a grounded object, such as the metal enclosure, in order to discharge the electrostatic potential in your body.

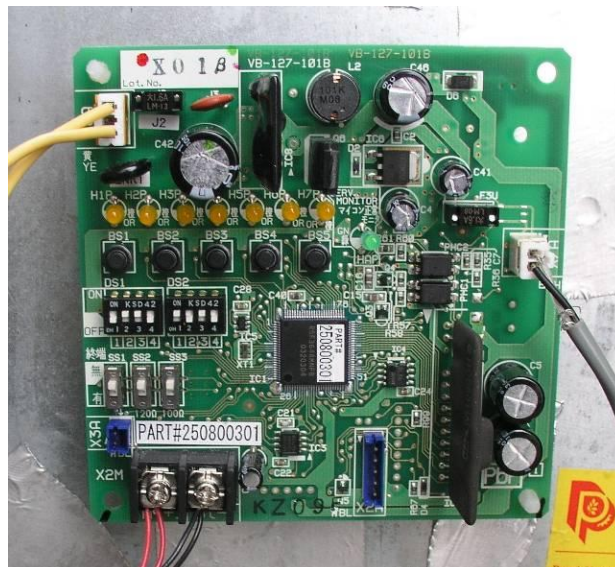
New DIII-NET Communication Gateway

⚠ WARNING

Hazardous voltage. Can cause severe injury or death. Disconnect electric power before servicing equipment. More than one disconnect may be required to de-energize the unit.

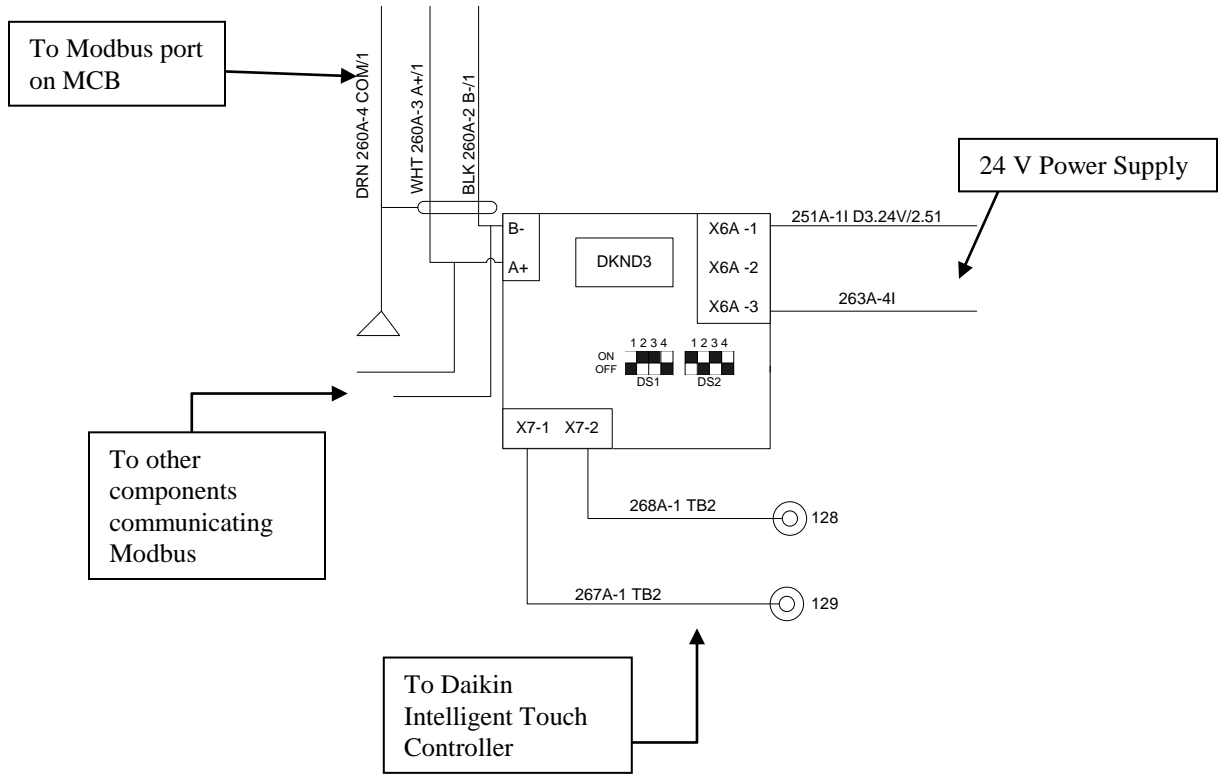
1. Remove power from the MicroTech III Applied Air Handling Unit Controller.
2. If a DIII-NET Communication Gateway has already been factory installed go to step 8, otherwise continue to step 4.
3. Remove power from the McQuay Air Handling Unit.
4. Install DIII-NET Communication Gateway on the back wall of the housing unit on standard circuit board mounts, see Figure 3.

Figure 3, DIII-NET Communication Gateway in unit.



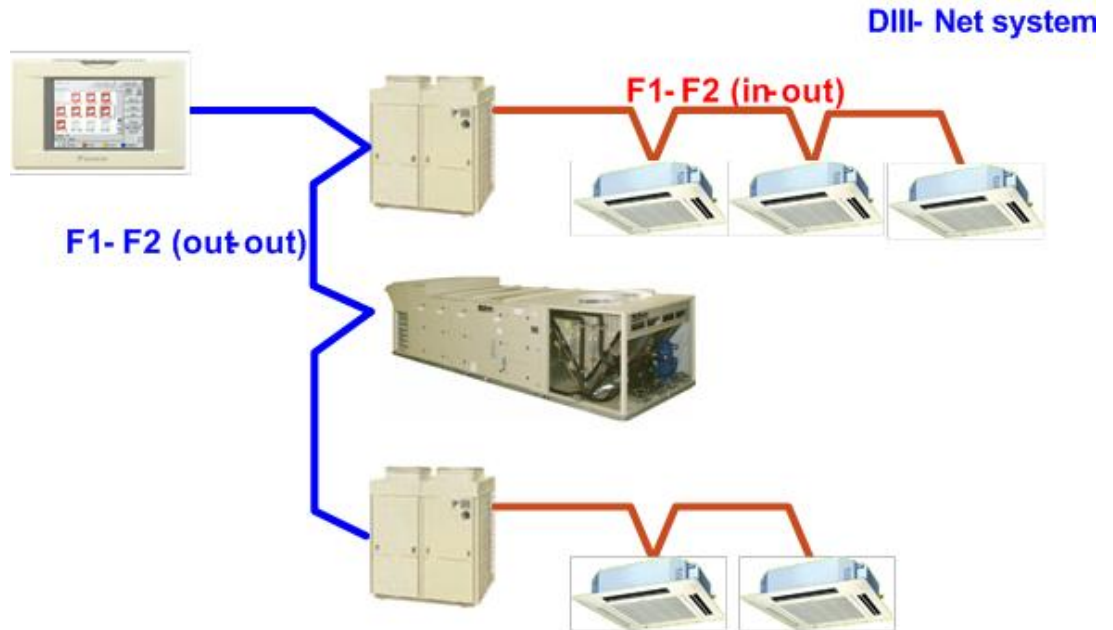
5. Connect field supplied 24V power to DIII-NET Communication Gateway, see Figure 3.
6. Connect wire from the MicroTech III unit controller's Modbus port to the DIII-NET Communication Gateway. See Figure 4.

Figure 4, DIII-NET Communication Gateway Schematics



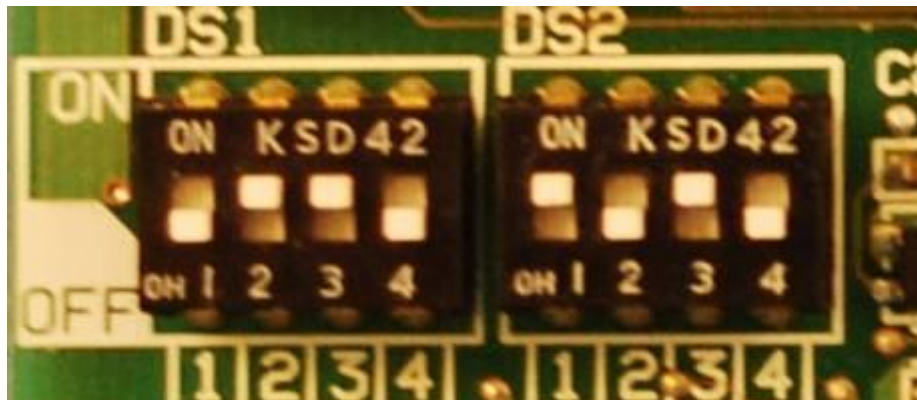
7. If there are other devices using Modbus communication, then use a daisy chain to integrate the DIII-NET Communication Gateway into the unit's Modbus communication network, see Figure 4.

Figure 5, DIII-NET Wiring Schematic



8. The DIII-Net Communications Gateway is treated like any other outdoor unit on the DIII-Net communications trunk (See Figure 5).
 - a. Connect communication the wires from the DIII-Net outdoor unit to outdoor unit trunk to the DIII-Net communications port (See Figure 4). Polarity does not matter. For more information on DIII-Net communications wiring refer to DCS601C71
9. Confirm that binary DIP switches on the DIII-NET Communication Gateway are configured as in Figure 6.

Figure 6, DIP Switches, 0110 1010.



Note: In Figure 6, flipping the binary switches up is on, and flipping them down is off.

10. Power up the MicroTech III Applied Air Handling Unit and controller.
11. Configure MicroTech III and Daikin VRV unit controllers as instructed in the [Integration section](#).

Replacing an Existing DIII-NET Communication Gateway

To replace a DIII-NET Communication Gateway:

WARNING

Hazardous voltage. Can cause severe injury or death. Disconnect electric power before servicing equipment. More than one disconnect may be required to de-energize the unit.

1. Remove power from the McQuay Applied Air Handling Unit.
2. Disconnect all wiring to DIII-NET Communication Gateway.
3. Remove old DIII-NET Communication Gateway from mountings.
4. Replace with new DIII-NET Communication Gateway in same manner as the old board.
5. Reconnect all wiring. See Figure 2.
6. Confirm binary switches per instructions in step 8 of section New DIII-NET Communication Gateway.
7. Power up the McQuay Applied Air Handling Unit.
8. Confirm address and parameters on unit controller, as per instructions in section Integration.

Integration

Once the DIII-NET Communication Gateway has been properly installed on the unit controller, it is then possible to integrate the unit controller with the Daikin Intelligent Touch Controller. The configuration process is described in the following section.

Configuring the DIII-NET Communication Gateway

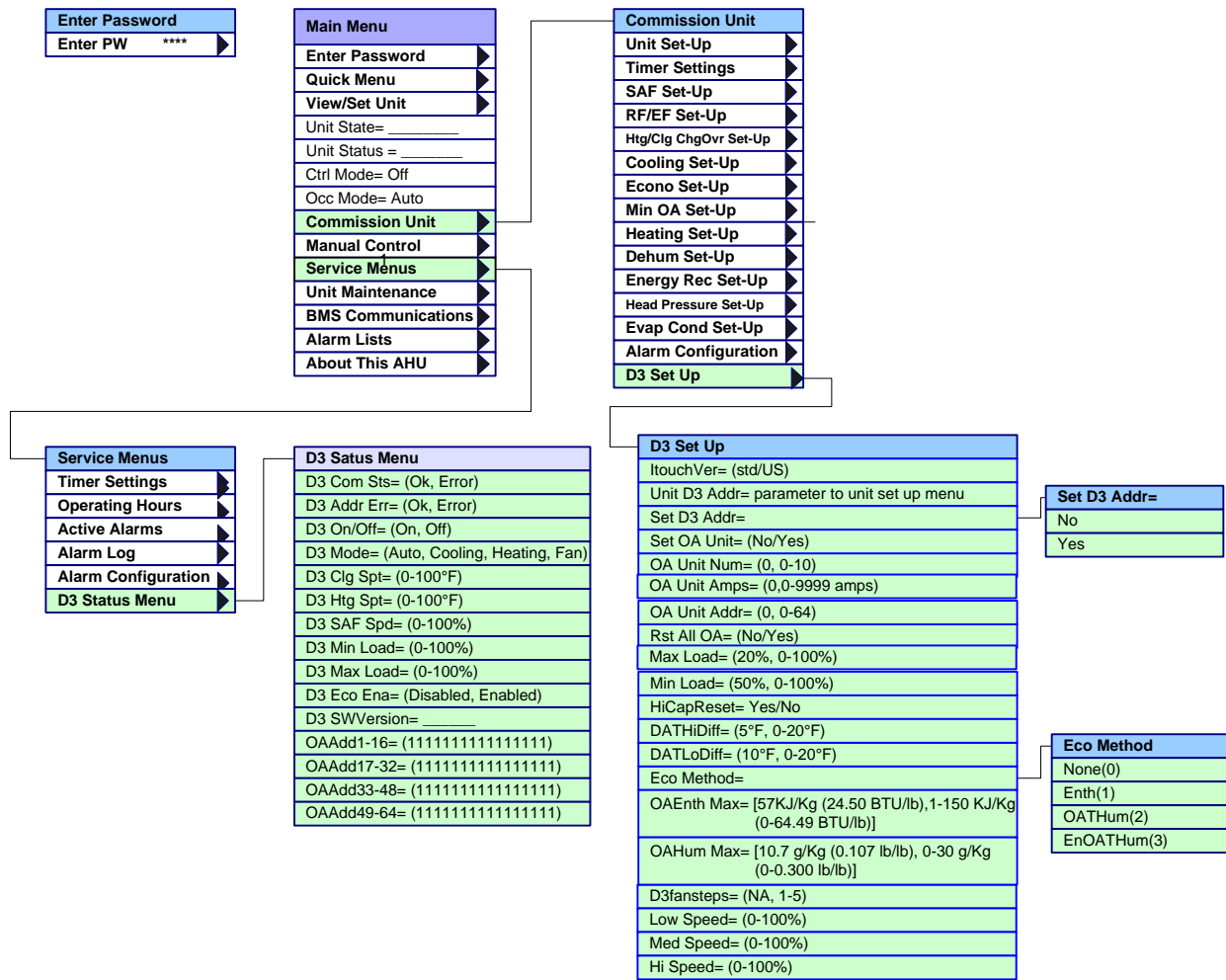
The MicroTech III Applied Air Handling Unit Controller and optional DIII-NET Communication Gateways are designed, programmed, and configured at the factory. However, the DIII-NET Communication Gateway needs to have a unique indoor unit address compatible with the existing DIII network. This address and any other configurations can be set through the keypad/display on the MicroTech III AAH Unit Controller and Intelligent Touch Controller. The unit is ready to operate with the default parameter values in the unit controller even before you change the default parameters for your particular network. Appendix B lists the menu items for the “D3 Set-Up Menu” and “D3 Status Menu.”

Note: Refer to Operation Manual OM 920 for details regarding the MicroTech III Applied Air Handling Unit Controller keypad/display. Manual is available on www.mcquay.com.

DIII-NET Communication Gateway Addressing

The following diagram details the menu structure of the MicroTech III Applied Air Handling Unit Controller related to the DIII-NET Communication Gateway.

Figure 7 MicroTech III Menu Structure



To Configure the DIII-NET Communication Gateway using the MicroTech III Keypad/Display:

- 1) Navigate to the Enter Password screen if you have not already entered a password. If you have entered a password, skip to step 3.
- 2) Enter Password: 6363.
- 3) Navigate to Commission Unit\D3 Set Up menu
- 4) In D3 Set-Up menu, set “ITouch Version” as desired
 - a) “USw/Spt” – For use with Intelligent Touch Controller software versions 6.XX. This setting allows the discharge air temperature setpoints to be adjusted by the Intelligent Touch Controller; however the range for this setpoint is 60F-90 degrees F.

- b) “USw/oSpt” – For use with Intelligent Touch Controller software versions 6.XX. This setting prevents the discharge air temperature setpoints from being adjustable by the Intelligent Touch Controller; however, set points can be monitored (for applications where the setpoint will be less than 60 degrees F or greater than 90 degrees F).
 - c) “Std” – For use with Intelligent Touch Controller software versions 4.XX. This setting is allows for the discharge air temperature setpoints to be adjusted with in the range set by the MicroTech III controller.
-
- 5) Set “Unit D3 addr” to your unit’s particular address. This is the parameter on the iTouch controller.
 - 6) Set the ‘Low Speed =’, ‘Med Speed =’, and ‘High Speed =’ parameters to the percentages that you want when receiving a Low, Med, or High speed command from the intelligent Touch Controller.
 - 7) Change “Set D3 addr” to “Yes” this should automatically switch back to “No”. This menu item saves the address from Step 6

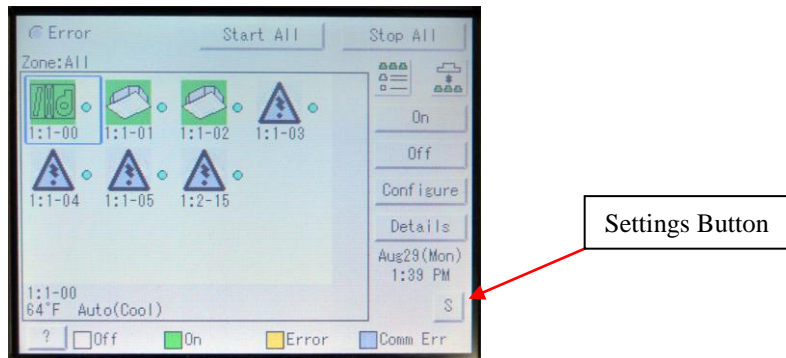
Intelligent Touch Controller Configuration

The Intelligent Touch Controller also needs to be configured. This section shows how to change the icon for a zone and how to set the dead band to zero. Refer to the Intelligent Touch Manual for more information on navigating the Intelligent Touch Controller menus. The Intelligent Touch Manual is available on www.daikinac.com.

Change Icon Intelligent Touch Controller:

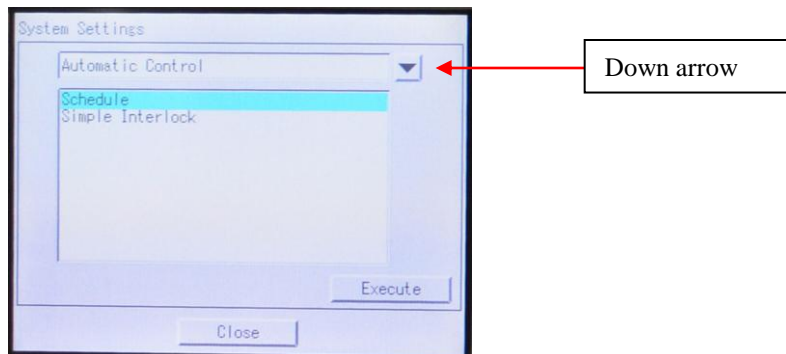
1. Select Settings by pressing the “S” button in lower right corner, indicated by the red arrow.

Figure 8, Zone Screen on Intelligent Touch Controller



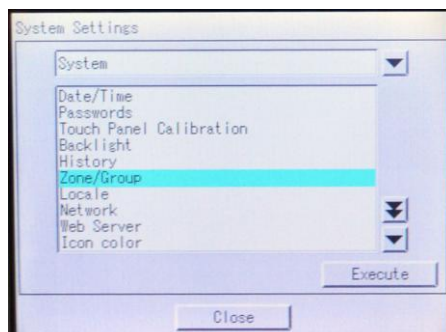
2. In the Settings Menu press the Down arrow, select “System” and then press Execute.

Figure 9, System Setting Screen Shot, Intelligent Touch Controller



3. When the System menu displays as shown in Figure 16, select “Zone/Group” and then press the Execute button.

Figure 10, Zone/Group Selection Screen, Intelligent Touch Controller



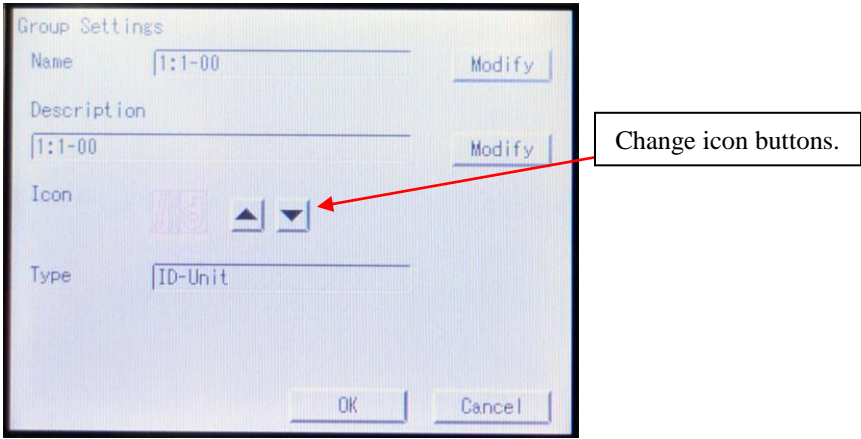
- 4. In the Zone / Group Settings screen, press the “Settings” button in the “Reg. Groups” box and then OK.

Figure 11, Zone / Group Screen



- 5. Use the triangular Up and Down arrow buttons to change the icon as desired and then press OK.

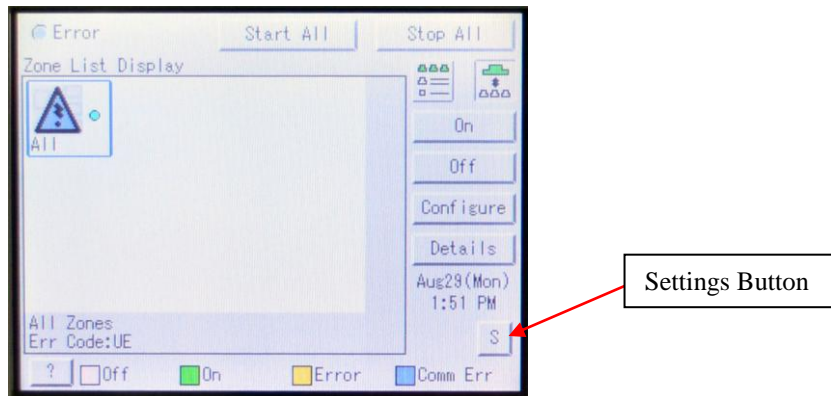
Figure 12, Group Settings Screen Shot



Creating a New Zone and Setting the Intelligent Touch Controller Dead Band

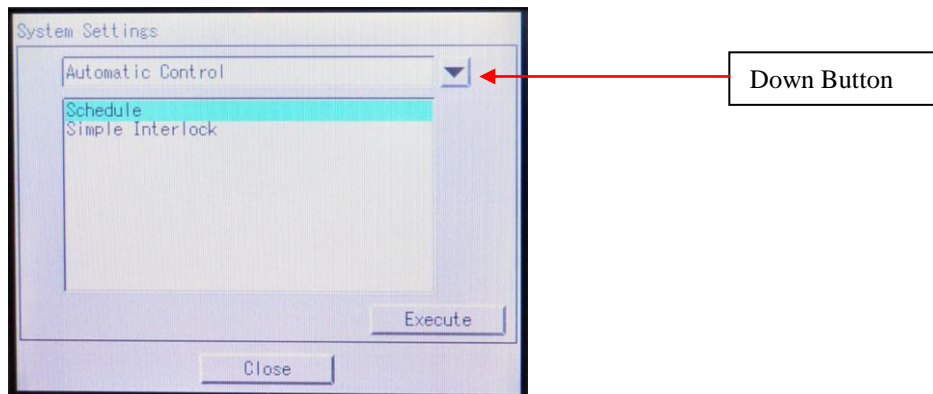
1. From the main screen the zone “All” should be highlighted, as in Figure 19. From this screen press the Settings button in the lower right corner, indicated with the red arrow.

Figure 13, All Zones Display on Intelligent Touch Controller



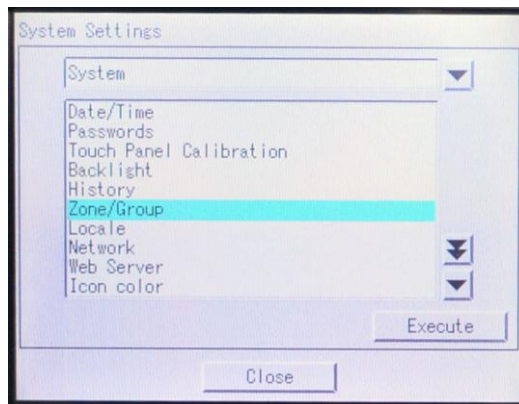
2. In the Settings Menu press the triangular down button, and then change “Automatic Control” (Figure 20), to “System” (Figure 21). Press the Execute button.

Figure 14, System Settings Screen



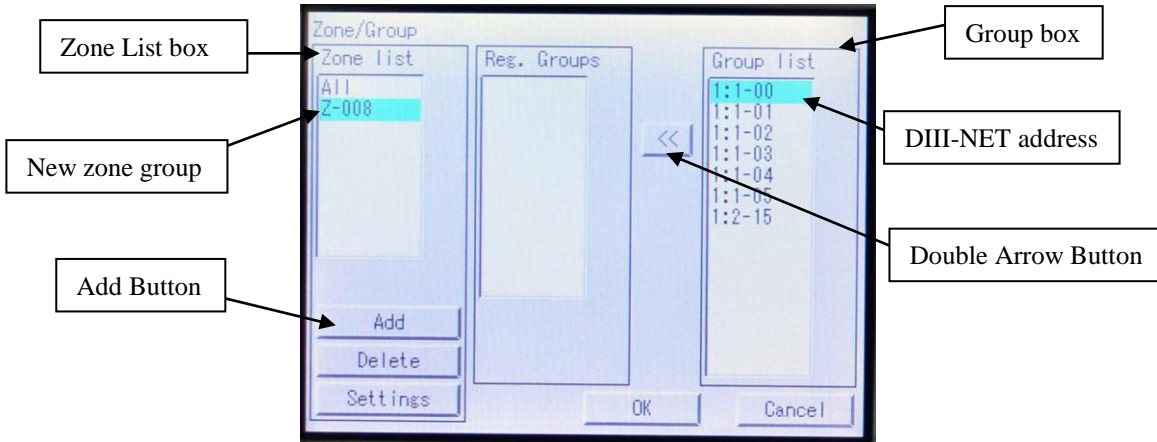
3. When the System menu displays as in Figure 21, select “Zone/Group” then press “Execute”.

Figure 15, System Menu for Selecting Zone/Group



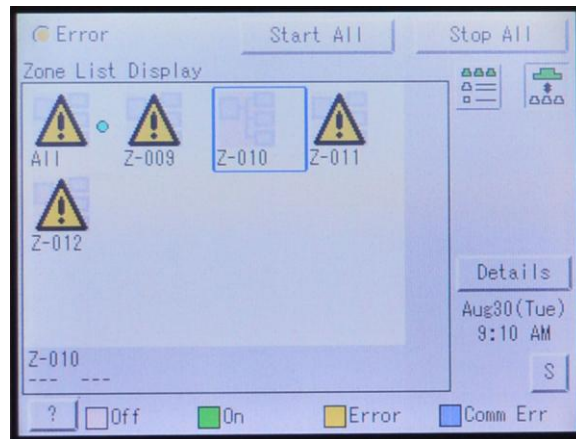
4. Make a new zone group populated only by the DIII-NET Communication Gateway as follows:
 - Under the “Zone List” box press the “Add” button and make sure the new zone group is highlighted.
 - Highlight the unit DIII-NET Communication Gateway address from the “Group” box.
 - Press the double arrow button to add the unit to that zone.

Figure 16, System Zone Group Screen



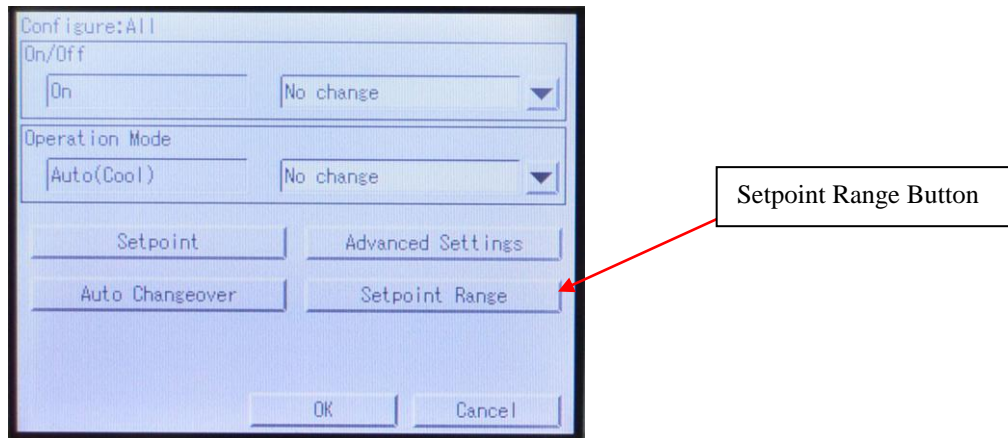
5. Press the “OK” button twice to get back to the main screen. The main screen should look similar to Figure 22 below. Make sure the zone group created in step 4 is highlighted with a blue line around it, and then press the “Configure” button. If it is not highlighted, press to select it.

Figure 17, System Menu for Setting up New Zone



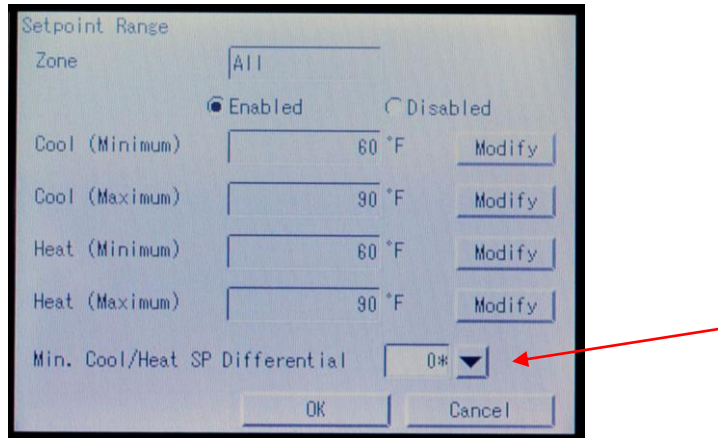
6. From the Configure screen press the “Setpoint Range” button. Then press OK.

Figure 18, Configure Screen for Setting Setpoint Range



7. From the “Setpoint Range” screen, set “Min Cool/Heat SP Differential” to “0*”.

Figure 19, Setpoint Range Configuration Screen



Intelligent Touch Controller Operation

The following section describes basic operation related to the MicroTech® III Air Handling unit through the Intelligent Touch Controller interface. Refer to ED72-423 for more information about the operation of the Intelligent Touch Controller, available on www.daikinac.com.

MicroTech III Unit operation

1. Figure 26 shows the MicroTech III Air Handling unit running in Occupied mode.

Figure 20, MicroTech III Air Handling Unit in Occupied Mode



2. Figure 27 shows the MicroTech III Air Handling unit off in Unoccupied mode.

Figure 21, MicroTech III Air Handler Unit in Unoccupied Mode



3. Figure 28 shows the MicroTech III Air Handling unit running in Unoccupied operation (requires optional space sensor, refer to OM 920 for more information, available on www.mcquay.com).

Figure 22, MicroTech III Air Handler in Unoccupied Operation



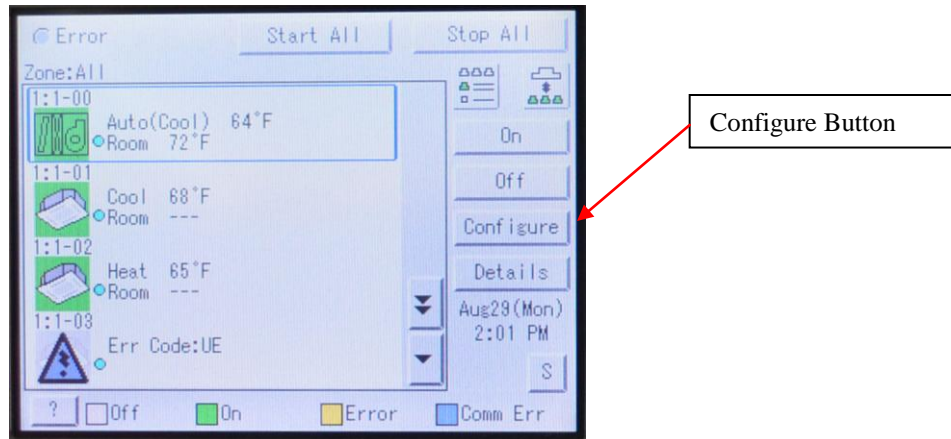
Adjusting Discharge Air Setpoint

Note: This only applies if 'Std' or 'USw/Spt' is selected for iTouch Version. Refer to DIII-Net Communication Gateway Addressing section for more information.

Note: Discharge air temperature setpoint cannot be adjusted with 'USw/oSpt' selected.

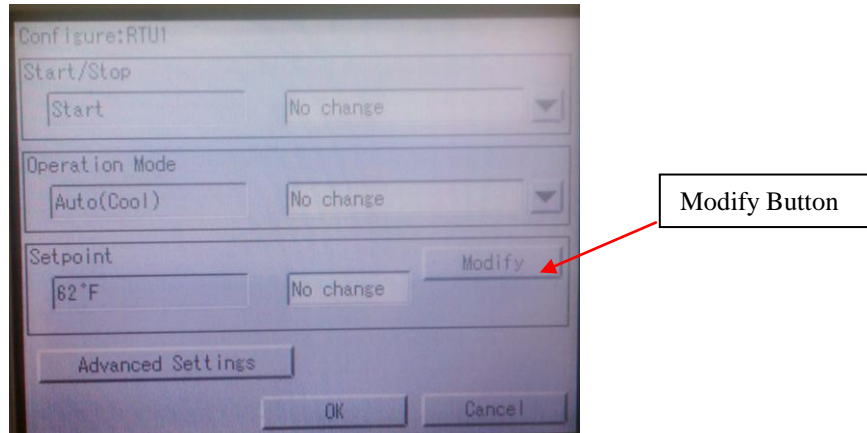
1. Highlight the MicroTech III Air Handling unit and select Configure.

Figure 23, With MicroTech III Air Handling Unit Selected



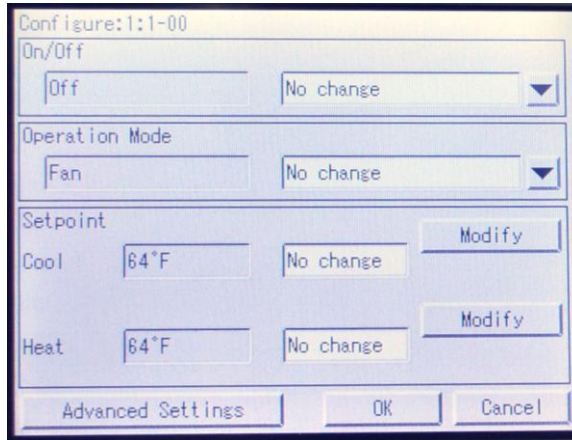
2. For 'Std' select Modify for the setpoint. Change setpoint and press OK.

Figure 24, Configure Screen for MicroTech III Air Handling Unit Std Version



3. For 'USw/Spt' versions select Modify for either setpoint.

Figure 25, Configure Screen for MicroTech III Air Handling Unit US Version.



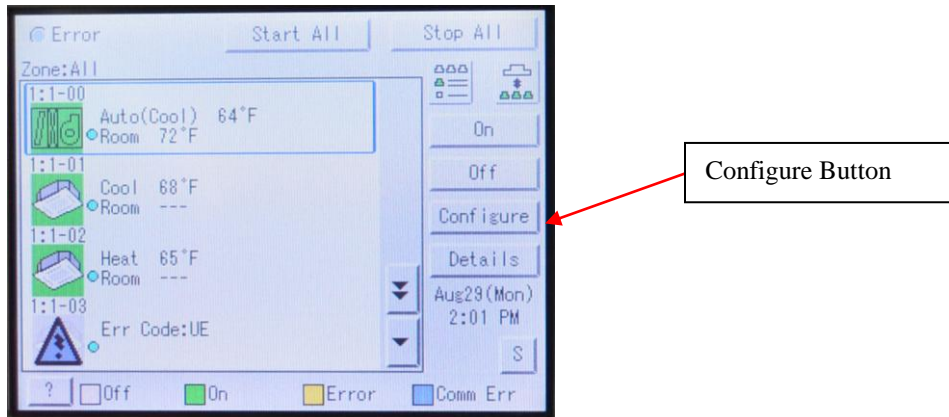
Note: For both versions, modifying the setpoint will adjust the discharge air setpoint for whatever mode the unit is currently in.

Adjusting Fan Speed

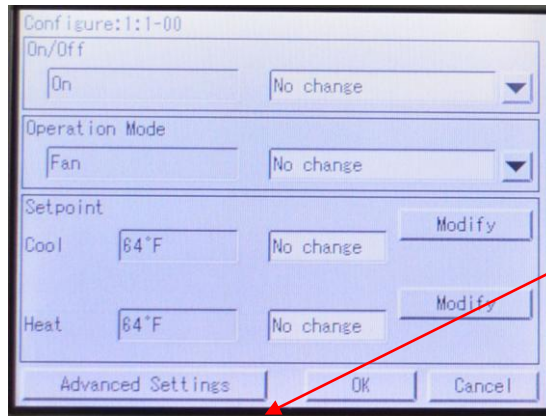
Note: This only applies if the Supply Fan Capacity Control flag is set to 'Speed' on the MicroTech III controller. Refer to OM 920 for more information on this topic.

1. Highlight the MicroTech III Air Handling unit and select Configure.

Figure 26, MicroTech III Air Handling Unit Selected.



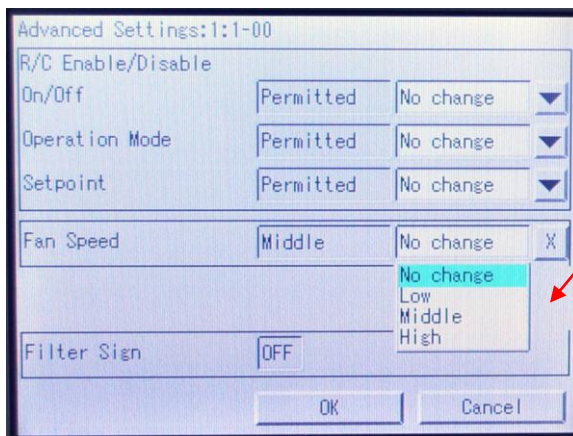
2. On the Configuration Screen, press the Advanced Settings button.



Advanced Settings Button

3. On the Advanced Settings screen, select the desired Fan Speed setting and press OK.

Figure 27, Advanced Settings Configuration Screen



Fan Speed Settings

Service Information

Test Procedures

If you can control the unit from its keypad, but you are not able to communicate with unit via the network, follows these steps:

- Check the network wiring
- Check the network parameters and verify that they are correct and that there are no duplicate devices on the network
- If the DIII-NET Communication Gateway still does not respond, contact the McQuay Controls Customer Support Group at 866-4MCQUAY (866-462-7829).

Parts List

Communication Board

Description	Part Number
DIII-NET Communication Gateway	250800301

Appendix A

Alarms

When an alarm is triggered, it will appear on both the MicroTech III unit and the Intelligent Touch Controller. Below is a list of alarms and their corresponding level, number, code and description.

Level	Alarm #	D3 Alarm Code	Description
	0	0	No active alarm
Warning	24	---	Dirty filter
Warning	28	13	Air flow switch(see 208, D3 don't have the alarm code for switch)
Warning	32	9J	Conductivity
Problem	106/111	J3	Discharge line refrigerant temperature 3 / 1 Sensor
Problem	107	E6	Standard comp3 error
Problem	114	L0	INV comp Error(comp alarm data over the ACS)
Problem	119	J6	Temperature sensor for defrost
Problem	121	J5	Suction line refrigerant temperature Sensor
Problem	124	F3	High discharge refrigerant temperature
Problem	126	E9	Exp valve
Problem	128	E7	OA fan
Problem	130	U0	Lo refrigerant charge
Problem	132	JC	Pressure Transducer Suction Line Sensor
Problem	134	JA	Pressure Transducer Discharge Line Sensor
Problem	135	UJ	Modbus Communication Error
Problem	136	79	Lo pressure difference
Problem	137	7J	Water flow
Problem	140	41	Water regulating valve
Problem	152-159	FC	Lo pressure 1 - 8
Problem	160-167	FA	High pressure 1 - 8
Problem	169	EE	Sump water level
Problem	179	C4	Entering fan temperature/Leaving coil temperature sensor
Problem	182	34	Return air sensor Error
Problem	185	CJ	Space sensor error
Problem	188	H9	Outdoor air temperature Sensor
Problem	191	80	Entering water temperature sensor
Problem	194	C4	Mixed air(RTU/OAT) temperature sensor
Problem	197	89	Freeze
Problem	199	10	Heat Fail
Fault	208	13	Air flow
Fault	212	CA	Lo discharge air temperature
Fault	216	CA	High discharge air temperature
Fault	220	C9	High return air temperature
Fault	224	6A	Duct High pressure Limit
Fault	228	CA	Discharge air sensor
Fault	244	H1	Control temperature sensor error
Fault	250	E0	Emergency stop
Fault	252	89	Freeze

Appendix B

Configurable Parameters

Table 4 defines the different parameters that are available in the D3 Set Up menu. The default values and acceptable ranges of values are also included.

Table 2 DIII Set-Up Menu

Menu Item	Description	Default	Range
ItouchVer	Sets the Version of Intelligent Touch Controller software	std	'Std' / 'USw/Stp' / 'USw/oStp'
Unit D3 Addr	Particular address for unit	N/A	1-00 - 8-15
Set D3 Addr	Saves particular DIII address	No	Yes / No (reverts back to no)
Temp Display	Selects which temperature to display	DAT	None, DAT, Space, RAT, OAT

This is a list of the menu items in the DIII Status Menu on the MicroTech III controller. Also listed is a description of the item, its default value, range of values or enumerations, if it can be read or written to, and which controller can change the value of the parameter. Most of the DIII Status Menu items read in values from the Intelligent Touch Controller and display them on the MicroTech III controller. Not all menu items will always be shown on the MicroTech III controller. There are items that will not show unless other parameters are set to a specific value. Refer to the OM 920 for more information.

Table 3 DIII Status Menu

Menu Items	Description	Default	Range	R / W
D3 Com Sts	Displays status of D3 Gateway	OK	OK, Error	Read
D3 Addr Err	Displays address error	OK	OK, Error	Read
D3 On/Off	Displays D3 on or off	On	On, Off	Read
D3 Mode	Displays D3 mode	Auto	Auto, Cooling, Heating, Fan	Read
D3 Clg Spt	Displays cooling set point	N/A	0 - 100°F	Read
D3 Htg Spt	Displays heating set point	N/A	0 - 120°F	Read
D3 SAF Spd	Displays fan speed parameter	N/A	Low, Med, High	Read
D3 Min Load	Displays max load to enable economizer	20%	0 - 100%	Read
D3 Max Load	Displays min load to enable economizer	50%	0 - 100%	Read
D3 Eco Ena	Displays if Economizer is enabled	N/A	(Disabled, Enabled)	Read
D3 SWVersion	Displays software version	N/A	N/A	Read
OAAAdd1-16	Displays valid Air-Net address	N/A	0 - 16	Read
OAAAdd17-32	Displays valid Air-Net address	N/A	17 - 32	Read
OAAAdd33-49	Displays valid Air-Net address	N/A	33 - 49	Read
OAAAdd49-64	Displays valid Air-Net address	N/A	49 - 64	Read
SelectOAAAddr	Selects OA unit address to displays setup for	N/A	0 - 64	R / W
CurrOAAAddr	Displays current OA address selected	N/A	0 - 64	Read

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